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EXAMINER	
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ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/756,767	KYO ET AL.	
	Examiner	Art Unit	
	Robert T. Crow	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17,20-22,24-27,29-31 and 33-42* is/are pending in the application.

4a) Of the above claim(s) *1-16 and 34-42* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17, 20-22, 24-27, 29-31, and 33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/29/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Art Unit: 1634

DETAILED ACTION

Status of the Claims

1. This action is in response to papers filed 13 February 2008 in which claims 17 and 21 were amended, claim 23 was canceled, and no new claims were added. All of the amendments have been thoroughly reviewed and entered.

The previous rejections under 35 U.S.C. 112, second paragraph, are withdrawn in view of the amendments.

Applicant's arguments regarding the teachings of Fodor et al, see the Remarks filed 13 February 2008, with respect to the previous rejection(s) of the claim(s) under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the prior art of Andreadis et al as detailed below.

Applicant's arguments have been thoroughly reviewed and are addressed, as they apply to the new rejections below, following the rejections.

Claims 17, 20-22, 24-27, 29-31, and 33 are under prosecution.

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn in view of Applicant's persuasive arguments regarding the teachings of Fodor et al.

Information Disclosure Statement

3. The Information Disclosure Statement filed 29 February 2008 is acknowledged. However, documents JP 2002-333446 and JP 4-501605 are not being considered because no English language translations have been provided. In addition, the Japanese Office Actions have not been considered because there is no publication date and are not in English. See 37 CFR 1.98.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 17 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 17 and 20 are indefinite in claim 17, which recites the limitation "said double-stranded oligonucleotide" in line 10 of claim 17 because the singular recitation "said double-stranded oligonucleotide" lacks antecedent basis in the plural recitation of "a plurality of double-stranded oligonucleotides" in line 4 of claim 17. It is suggested the claim be amended to reflect proper antecedent basis.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 17, 21-22, 24-27, and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corn et al (U.S. Patent No. 6,127,129, issued 3 October 2000) in view of Andreadis et al (Nucleic Acids Research, vol. 28, e5, January 2000).

Regarding claim 17, Corn et al teach a biomolecule interaction measuring method. In a single exemplary embodiment, Corn et al teach providing a double-stranded oligonucleotide array comprising a background region on which a hydrophilic polymer molecule is immobilized and a region on which a plurality of double-stranded oligonucleotides are immobilized on a metal substrate; namely, Figure 1, wherein PEG is the hydrophilic polymer (column 10, lines 27-28) on the background region, the substrate is gold, and the attached DNA is double stranded (column 12, Example 1). Corn et al further teach measuring the interaction between said double-stranded oligonucleotides and a biomolecule or aggregate thereof; namely, SPR (i.e., surface plasmon resonance) imaging measurements are taken of the binding of single-stranded DNA binding protein to an array of double-stranded DNA sequences (figure 5 and Example 1). Corn et al further teach each of said double-stranded oligonucleotide include a first single-stranded oligonucleotide and a second single-stranded oligonucleotide, said first and second single-stranded oligonucleotides being entirely or partially bonded together in a complementary manner to form said double-stranded oligonucleotide; namely, the array has double stranded DNA sequences (Example 1). Corn et al also teach only said first single-stranded oligonucleotide is bonded to said substrate; namely, Figure 5, wherein the double-stranded DNA is prepared by immobilizing an oligonucleotide (e.g., D2) and hybridizing the complement to the sequence (column 13, lines 7-28).

Corn et al also teach the first single stranded thiolated oligonucleotide is bonded to said substrate by use of a heterobifunctional molecule in the form SSMCC, which binds to the amino group of MUAM (column 8, line 65-column 7, line 20 and Figure 4).

Corn et al do not teach a hydrophilic repeating unit (expressed by –(O-R1)n, wherein R1 is an alkylene group of the polymer (i.e., polyethylene glycol, or PEG). Thus, Corn et al teach a base method that differs from the instantly claimed method because Corn et al does not teach a heterobifunctional

linker wherein the X group and the Y group linked with a polyethylene glycol portion is linked to the MUAM.

However, Andreadis et al teach the immobilization of thiolated oligonucleotides to solid surfaces (e.g., beads), wherein the oligonucleotides are immobilized using the heterobifunctional linker NHS-PEG-MAL, which has a functional group X in the form of an NHS (i.e., succinimidyl) group and a functional group Y in the form of a MAL (i.e., maleimide) group and a hydrophilic repeating polymer in the form of polyethylene glycol (page iii, column 1, first full paragraph). The NHS-PEG-MAL has a molecular weight of 2000, and thus has between 4 and 450 repeating OR (i.e., ethylene glycol) and is hydrophilic. The NHS-PEG-Mal molecules bind to the aminated surface (i.e., of the beads), and the thiolated DNA binds to the maleimide portion (page iv, column 2, first full paragraph). Andreadis et al also teach the NHS-PEG MAL linkers have the added advantage of allowing subsequent enzymatic reactions (in the form of PCR reactions) to be performed using the immobilized nucleic acids (Abstract). Thus, Andreadis et al teach the known technique of using polyethylene glycol linkers in nucleic acid arrays.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the method comprising heterobifunctional linkers as taught by Corn et al by substituting the specific heterobifunctional linker NHS-PEG-MAL as taught by Andreadis et al in place of the SSMCC linker of Corn et al to arrive at the instantly claimed invention with a reasonable expectation of success. The amino terminus of the MUAM of Corn et al would bind to the NHS group on the linker of Andreadis et al, and the MAL group on the ethylene glycol based linker of Andreadis et al, which is hydrophilic, binds to the thiolated DNA of Corn et al. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a method having the added advantage of allowing subsequent enzymatic reactions (in the form of PCR reactions) to be performed using the immobilized nucleic acids as explicitly taught by Andreadis et al (Abstract). In addition, it would have been obvious to the ordinary artisan that the known technique of using the NHS-PEG-MAL linkers of Andreadis et al could have been applied to the substrate of Corn et al

with predictable results because the NHS-PEG-MAL linkers of Andreadis et al predictably result in linkers suitable for attaching oligonucleotides to substrates.

Regarding claims 21-22, 24--27, and 29-30, Corn et al teach a biomolecule interaction measuring method. In a single exemplary embodiment, Corn et al teach measuring the interaction between a first biomolecule and a second biomolecule or an aggregate thereof in the form of taking SPR (i.e., surface plasmon resonance) imaging measurements of the binding of single-stranded DNA binding protein to an array of single-stranded and double-stranded DNA sequences (i.e., claim 27; Figure 5 and Example 1). Corn et al also teach use of a solid substrate with a solid surface comprising a background region on which a hydrophilic polymer molecule is immobilized other than the area; namely, Figure 1, wherein PEG is the hydrophilic polymer (column 10, lines 27-28) on the background region, and the PEG is not on the other areas of the substrate. The substrate also has a region on which said first biomolecule is immobilized; namely, DNA is immobilized on areas other than those where the PEG is immobilized (Figure 1).

Corn et al further teach the method wherein said substrate includes plural kinds of first biomolecules arranged thereon in an array arrangement; namely, Figure 1 and Example 1, wherein Example 1 has two different DNA sequences immobilized on a checkerboard surface (i.e., claim 26; column 12, lines 45-55).

Corn et al also teach the method wherein the interaction between said first biomolecule and said second biomolecule or aggregate thereof is measured through surface plasmon resonance imaging (i.e., claim 29; Figure 6; column 5, lines 40-50), and wherein said second biomolecule is a protein; namely, single-stranded DNA binding protein (i.e., claim 30; Example 1).

Corn et al also teach the first single stranded thiolated oligonucleotide is bonded to said substrate by use of a heterobifunctional molecule in the form SSMCC, which binds to the amino group of MUAM (column 8, line 65-column 7, line 20 and Figure 4). MUAM is a compound X'-R'-Y', wherein X is a thiol

bound to a thin gold layer on the substrate, R is an organic group in the form of 11 CH2 groups, and Y is an amino group that binds to SSMCC (i.e., claim 25; Figures 1 and 4).

Corn et al do not teach a hydrophilic repeating unit (expressed by –(O-R1)n, wherein R1 is an alkylene group of the polymer repeated 4 to 450 times (i.e., polyethylene glycol, or PEG; claim 21) having a molecular weight of 200 to 20000 (i.e., claim 22) or the X and Y groups of claim 24 in a PEG chain.

However, Andreadis et al teach the immobilization of thiolated oligonucleotides to solid surfaces (e.g., beads), wherein the oligonucleotides are immobilized using the heterobifunctional linker NHS-PEG-MAL, which has a functional group X in the form of an NHS (i.e., succinimidyl) group and a functional group Y in the form of a MAL (i.e., maleimide) group (i.e., claim 24) and a hydrophilic repeating polymer in the form of polyethylene glycol (page iii, column 1, first full paragraph). The NHS-PEG-MAL has a molecular weight of 2000, and thus has between 4 and 450 repeating OR (i.e., ethylene glycol) units (i.e., claims 21-22) and is hydrophilic. The NHS-PEG-MAL molecules bind to the aminated surface (i.e., of the beads), and the thiolated DNA binds to the maleimide portion (page iv, column 2, first full paragraph). Andreadis et al also teach the NHS-PEG MAL linkers have the added advantage of allowing subsequent enzymatic reactions (in the form of PCR reactions) to be performed using the immobilized nucleic acids (Abstract). Thus, Andreadis et al teach the known technique of using polyethylene glycol linkers in nucleic acid arrays.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the method comprising heterobifunctional linkers as taught by Corn et al by substituting the specific heterobifunctional linker NHS-PEG-MAL as taught by Andreadis et al in place of the SSMCC linker of Corn et al to arrive at the instantly claimed invention with a reasonable expectation of success. The amino terminus of the MUAM (i.e., claim 25) of Corn et al would bind to the NHS group on the linker of Andreadis et al, and the MAL group on the ethylene glycol based linker of Andreadis et al, which is hydrophilic, binds to the thiolated DNA of Corn et al. The linker has a molecular weight of 200 to 2000 (i.e., claim 22), an n value of 2-10 ethylene glycol units (i.e.,

claim 21), and succinimidyl and maleimidyl groups as X and Y (i.e., claims 21 and 24). The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in a method having the added advantage of allowing subsequent enzymatic reactions (in the form of PCR reactions) to be performed using the immobilized nucleic acids as explicitly taught by Andreadis et al (Abstract). In addition, it would have been obvious to the ordinary artisan that the known technique of using the NHS-PEG-MAL linkers of Andreadis et al could have been applied to the substrate of Corn et al with predictable results because the NHS-PEG-MAL linkers of Andreadis et al predictably result in linkers suitable for attaching oligonucleotides to substrates

9. Claims 20 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corn et al (U.S. Patent No. 6,127,129, issued 3 October 2000) in view of Andreadis et al (Nucleic Acids Research, vol. 28, e5, January 2000) as applied to claims 17 and 30 above, and further in view of Noblett (U.S. Patent No. 6,362,004 B1, issued 26 March 2002).

Regarding claims 20 and 33, the method of claim 17 and 30 are discussed above in Section 8.

Neither Corn et al nor Andreadis et al teach markers on the array indicative of spots. Thus, Corn et al in view of Andreadis et al teach a base method that differs from the instantly claimed method because Corn et al in view of Andreadis et al does not teach markers on the array indicative of spots.

However, Noblett et al teach the use of microarrays comprising immobilized nucleic acids (column 1, lines 20-30) having marks indicative of spots (i.e., fiducials, Abstract) with the added advantage of allowing positioning and alignment of the substrate for spot analysis and comparison procedures (Abstract). Thus, Noblett teaches the known technique of using markers on the array indicative of spots.

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified the method as taught by Corn et al in view of Andreadis et al with the fiducials as taught by Noblett with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because the modification would have resulted in a

method having the added advantage of allowing positioning and alignment of the substrate for spot analysis and comparison procedures as explicitly taught by Noblett (Abstract). In addition, it would have been obvious to the ordinary artisan that the known technique of using the markers of Noblett could have been applied to the substrate of Corn et al in view of Andreadis et al with predictable results because the markers of Noblett predictably result in indicators of spots suitable for use with nucleic acid arrays.

10. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Corn et al (U.S. Patent No. 6,127,129, issued 3 October 2000) in view of Andreadis et al (Nucleic Acids Research, vol. 28, e5, January 2000) as applied to claim 30 above, and further in view in view of Wiegel (U.S. Patent No. 6,107,034, issued 22 August 2000).

Regarding claim 31, the method of claim 30 is discussed above in Section 8.

Corn et al do not teach markers indicative of spots. While Corn et al also teach the second biomolecule is a protein in the form of single-stranded DNA binding protein (Example 1), Corn et al do not specifically teach transfer factors. Thus, Corn et al in view of Andreadis et al teach a base method that differs from the instantly claimed method because Corn et al in view of Andreadis et al does not teach transfer factors.

However, Wiegel teaches the detection of binding of a transfer factor to nucleic acids (e.g., GATA-3 binding to the DNA motif recognized by the protein; column 3, lines 52-63) and the use of nucleic acid arrays (column 6, lines 3-14) with the added benefit that detection of the transfer factor GATA-3 provides a diagnostic test for a hormone responsive tumor (Abstract). Thus, Wiegel teaches the known technique of using transfer factors.

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have modified the method comprising detection of protein binding as taught by Corn et al in view of Andreadis et al with the transfer factor protein GATA as taught by Wiegel et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because the modification would have resulted in a method having the added advantage of

providing a diagnostic test for a hormone responsive tumor as explicitly taught by Wiegel (Abstract). In addition, it would have been obvious to the ordinary artisan that the known technique of using the transfer factors of Wiegel could have been applied to the substrate of Corn et al in view of Andreadis et al with predictable results because the transfer factors of Wiegel predictably bind to nucleic acids.

Response to Arguments

11. As noted above, Applicant's arguments regarding the teachings of Fodor et al, see the Remarks filed 13 February 2008, with respect to the previous rejection(s) of the claim(s) under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the prior art of Andreadis et al as detailed above.

Applicant's arguments, as they apply to the new rejections presented above, are addressed below.

A. Applicant argues on page 13 of the Remarks filed 13 February 2008 (i.e., the "Remarks") that the Office Action mischaracterizes the linker of Corn et al because MUAM is only a portion of the linker of Corn.

However, the MUAM linker is interpreted as part of the surface to which the SSMCC linker is attached. This interpretation is clearly in accordance with the embodiment encompassed by instant claim 25, as well as Applicants own synopsis of Corn et al on page 13 of the Remarks, which states that

"the amino group [i.e., of MUAM] binds to SSMCC, which binds to thiol-modified DNA."

Thus, Applicant has clearly described SSMCC as a heterobifunctional crosslinker binding DNA to a surface comprising the amino groups of MUAM.

In addition, any additional linkers of layers are encompassed by the open claim language "comprising" of the instant claims, or are alternatively interpreted as part of the surface of the array as described above.

Further, Applicant previously provided Kyo et al (Genes to Cell, vol. 9, pages 153-164 (2004)) as support for alleged unexpected results. Figure 2 of Kyo et al clearly shows 8-AOT as an intermediate and additional linker between the NHS-PEG-MAL linker and the surface of the support. Indeed, Applicant underscores this point on page 18 of the Remarks. Applicant states therein that "in Kyo, the linker includes –(CH2)8-…."

Thus, if Kyo et al is in fact support for the instantly claimed invention, it is unclear how the MUAM of Corn et al is "mischaracterized" and must be interpreted as part of the linker while the 8-AOT of Figure 2 of Kyo et al is not also interpreted as part of the linker (i.e., because it is not required by instant claims 17, 20-22, 24, 26-27, 29-31, or 33).

B. As noted above, Applicant's arguments regarding Fodor et al have been fully considered and are persuasive.

C. Applicant argues on page 17 of the Remarks that not only the linker of Kyo et al shows unexpected results, but rather a large range of linkers, and that if a trend in the exemplified data would allow the artisan to reasonable extend the probative value thereof, nonobviousness of a broader claimed range can be supported, based on *In re Kollman*.

It is noted that Applicant admits on pages 17-18 of the Remarks that MPEP 716.02(d) requires that any teaching of unexpected results must be commensurate is scope with the claims.

Applicant's argument is not persuasive because a single data point (i.e., the NHS PEG MAL linker of Kyo et al) hardly describes "trend in exemplified data;" i.e., one data point is not a trend.

In addition, MPEP 716.02(d)-I specifically addresses *In re Kollman*, and explicitly states that "[t]he court held that the limited number of species exemplified [i.e., three] did not provide an adequate basis for concluding that similar results would be obtained for the other diphenyl ether herbicides within the scope of the generic claims." Thus, because Applicant has presented only one example having the alleged unexpected results, adequate basis for concluding that similar results would be obtained has clearly not been established.

It is further noted that the specific example in requires other specific structural limitations not listed in the previous Office Action; namely, a PEG thiol background, and 8-AOT on the Spot Region. (Figure 2 of Kyo et al). None of these limitations are required by the instant claims.

D. Applicant further argues on pages 17-18 of the Remarks that the comparison of NHS-PEG-MAL to the SSMCC linker is appropriate.

The examiner agrees. However, as admitted by Applicant on page 18 of the Remarks, the linker of Kyo et al is comprises 8 CH2 groups, which underscores the argument made by the examiner that Kyo et al is not commensurate in scope with instant claims 17, 20-22, 24, 26-27, 29-31, or 33 as detailed above.

E. Applicant presents arguments on page 19 of the Remarks that the linker of Corn et al is hydrophobic.

However, as noted in the rejections above, the modification of Corn et al with the linker of Andreadis et al results in a PEG coated background area, which is hydrophilic, and the NHS-PEG-MAL linker, which is also hydrophilic, attached to the MUAM molecules and the DNA molecules, thereby meeting the limitations of the claims.

F. Applicant's arguments with respect to the teachings of Drumheller et al have been considered but are moot in view of the new ground(s) of rejection.

G. Applicant's arguments regarding dependent claims 20, 33, and 31 on page 22 of the Remarks have been considered but are moot in view of the new ground(s) of rejection.

Examiner's Note

12. It is noted that Applicant's amendments to the claims eliminate many embodiments disclosed in the specification. For example, paragraph 0070 of the specification recites embodiments wherein the alkylene group is a five carbon alkoxy group. A five carbon alkoxy group has a unit molecular weight of 86; thus, any polymers having more than 232 five carbon units would fail to meet the requirements of claim 22. In addition, in the embodiment of claim 22 wherein the polymer has 232 five carbon units, the total weight of the X and Y groups cannot exceed 48 because the polymer cannot exceed a weight of

20000. Thus, the polymer of claim 22 is excluded from having any succinimide groups, any sulfonated succinimide groups, or any combination of the groups listed in paragraph 0061 of the specification having a combined weight of greater than 48.

Conclusion

13. No claim is allowed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571)272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert T. Crow/
Examiner, Art Unit 1634

/Diana B. Johannsen/
Primary Examiner, Art Unit 1634

Robert T. Crow
Examiner
Art Unit 1634